

Request for Reconsideration
U.S. Patent Application No. 10/695,484

REMARKS

Claims 1-32 are pending in the subject application, and all of the claims stand rejected. Favorable reconsideration of the application and allowance of all of the pending claims are respectfully requested in view of the following remarks.

Claims 1-11, 16-26, 29, and 30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,175,551 to Awater et al. in view of U.S. Patent No. 6,598,200 to Greenwood et al. Further, dependent claims 12-15, 27, and 28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Awater and Greenwood in view of U.S. Patent No. 5,263,048 to Wade. Applicant respectfully traverses these rejections for the following reasons.

Independent claim 1 sets forth a system for generating a signal for transmission in non-contiguous frequency bands that are separated by at least one segment of frequency spectrum excluded from use in transmitting the signal. According to claim 1, a non-contiguous spectrum selector converts a digital time-domain signal to a frequency-domain signal and excises a portion of the frequency-domain signal corresponding to the at least one segment of frequency spectrum. Thus, claim 1 requires the excised segment of frequency spectrum to lie between non-contiguous frequency bands that are used to transmit the signal. Independent method claim 20 similarly requires excising a segment of frequency spectrum separating non-contiguous frequency bands.

Awater does not disclose or suggest a system or method for transmitting a signal in non-contiguous frequency bands as required by independent claims 1 and 20. The scheme disclosed by Awater generally addresses the problem of large peak-to-average power ratios in orthogonal frequency (or code) division multiplex (OFDM and OCDM) by reducing the peak power of selected signal samples. As can be readily understood from Awater's disclosure, this process does not involve excising portions of the frequency spectrum between non-contiguous bands used to transmit the signal, but rather performing time-domain filtering to reduce the peak amplitude in certain signal samples.

The specific portion of Awater's disclosure relied upon by the Examiner is a low pass filter 56 shown in Fig. 4. As described by Awater at column 4, line 66 – column 5, line 6, low

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pass filtering is accomplished in the frequency domain by performing an FFT, setting the frequency components to zero above a desired frequency, and transforming the signal back to the time domain via an IFFT. However, by definition (and according to the description in Awater), a low pass filter passes low frequency components of a signal and filters out higher frequency components, i.e., those frequencies above a specific cut-off frequency. Consequently, the signal produced by Awater's low pass filter includes only frequencies in a band below the zeroed frequencies; there are no signal components remaining in another frequency band above the zeroed frequencies (otherwise, Awater's filter 56 would not be a low pass filter). Thus, Awater's low pass filter does not excise a portion of a frequency domain signal that separates non-contiguous bands of a signal to be transmitted, and the filtered signal produced by Awater's low pass filter does not include signal components in non-contiguous bands separated by a filtered-out (excised) band, as required by claims 1 and 20. In short, claims 1 and 20 do not read on a low pass filter, because a low pass filter, such as Awater's, filters out higher frequencies and does not excise frequencies to produce a signal with non-contiguous bands separated by the excised bands.

Moreover, claims 1 and 20 would not have been obvious from Awater, since it would not have been obvious to modify a low pass filter to filter out only an intermediate band of signals separating two non-contiguous bands. In Awater's scheme, the purpose of the low pass filter is to eliminate high-frequency components. Thus, modifying Awater's low pass filter to pass signals in a higher, non-contiguous frequency band would go against the stated purpose of Awater's low pass filter, which is to eliminate such high-frequency components.

Furthermore, it is clear from brief review of Applicant's Fig. 1 that the claimed non-contiguous spectrum selector does not perform a function analogous to low pass filtering, since Applicant's circuit includes a separate low pass filter 38 for this purpose. Thus, the subject matter of claims 1 and 20 and their dependent claims would not have been obvious from Awater.

Greenwood does not compensate for the deficiencies of Awater; thus, the subject matter of Applicant's claims 1 and 20 and their dependent claims would not have been obvious from any combination of Awater and Greenwood. Specifically, the Examiner cites Greenwood as

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teaching that OFDM schemes can employ non-contiguous frequency allocations, and argues that the OFDM signals disclosed by Awater could therefore employ a non-contiguous frequency spectrum.

However, even assuming the Examiner is correct in this regard, claims 1 and 20 would not have been obvious from the Examiner's proposed combination of Awater and Greenwood. Claims 1 and 20 do not merely require using a non-contiguous frequency spectrum. Rather, these claims require converting a time-domain signal to a frequency-domain signal, excising a portion of the frequency-domain signal which corresponds to at least one segment of frequency spectrum separating non-contiguous frequency bands used to transmit the signal, and then converting the excised signal back to the time domain for transmission. Like Awater, there is nothing in Greenwood that is remotely analogous to the claimed non-contiguous spectrum selector which performs these operations.

As explained above at length, Awater describes a low-pass filter which does not excise a frequency spectrum segment that separates non-contiguous frequency bands used to transmit a signal. Even if Awater's low-pass filter operated on an OFDM signal that employed non-contiguous frequency bands, there is still no suggestion from any combination of Awater and Greenwood to excise a frequency spectrum segment between non-contiguous frequency bands. Greenwood merely points out that, because OFDM involves simultaneously transmitting a plurality of signals on low-bandwidth sub-carriers, the frequencies of the sub-carriers need not be contiguous. However, there is certainly no suggestion in Greenwood that OFDM schemes are accomplished by converting time-domain signals to the frequency domain, excising a segment of frequency spectrum, and then converting the excised signal back into the time domain. OFDM merely involves transmitting a set of narrowband signals on selected set of narrowband sub-carriers.

In short, the fact that OFDM schemes naturally lend themselves to the option of using sub-carriers with non-contiguous frequency allocations does not change the fact that there is no suggestion in either Awater or Greenwood to convert a time-domain signal to a frequency-domain signal, excise a portion of the frequency-domain signal which corresponds to at least one

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segment of frequency spectrum separating non-contiguous frequency bands used to transmit the signal, and convert the excised signal back to the time domain for transmission, as required by Applicant's claims. This is not what is done in OFDM schemes, this is not what Greenwood suggests, and there is no obvious way to modify Awater's low pass filter to involve excision of frequency spectrum segments separating non-contiguous frequency bands used for transmission based on the teachings of Greenwood. Accordingly, the Examiner is respectfully requested to reconsider and withdraw this rejection.

Wade, which is cited for features recited in specific dependent claims, does not compensate for the deficiencies of Awater and Greenwood, since Wade also does not disclose or suggest excising a segment of frequency spectrum between non-contiguous frequency bands of a transmission signal. Consequently, the subject matter of claims 1 and 20 would not have been obvious from any combination of Awater, Greenwood, and Wade. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejections of claims 1-32.

In paragraph 5 of the Office Action, the Examiner states that Applicant's claims do not clearly recite the requirement of excising a portion of the frequency domain signal that separates non-contiguous frequency bands of a transmission signal. Since, contrary to the Examiner's assertion, Applicant's claims do quite plainly recite this requirement, the undersigned attorney called the Examiner for clarification on this point. As best understood, the Examiner's position appeared to be that, because the recited "segment of frequency spectrum" is initially recited in the preamble as separating the non-contiguous frequency bands, no patentable weight is being given to the meaning of the "segment of frequency spectrum," despite its being repeatedly recited in the body of the claim. This reading of the claim is improper, and the Examiner is invited to review MPEP 2111.02, which explains the proper treatment of the preamble in claims. It is often said that the body of the claim can breathe life into the preamble. In this case, the Examiner appears to be arguing the converse: a recitation in the preamble kills the body! In any event, the undersigned attorney discussed this issue with the Examiner's supervisor, Mr. Jay Patel, who upon reviewing the claims agreed that the Examiner's interpretation was improper and that Applicant's claim limitations must be given full patentable weight. Accordingly, if the

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Examiner continues to reject the claims, the Examiner is requested to discuss this issue with his supervisor.

In view of the foregoing, Applicant respectfully requests the Examiner to find the application to be in condition for allowance with claims 1-32. However, if for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is respectfully requested to call the undersigned attorney to discuss any unresolved issues and to expedite the disposition of the application.

Applicant hereby petitions for any extension of time that may be necessary to maintain the pendency of this application. The Commissioner is hereby authorized to charge payment of any additional fees required for the above-identified application or credit any overpayment to Deposit Account No. 05-0460.

Respectfully submitted,

/PJF/

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